

1. An air breathing gas turbine engine comprising:

a combustion chamber section;

a turbine section surrounding the combustion chamber section so that the combustion chamber section is nested at least in part within the turbine section, a rotor portion of the turbine section forming at least part of the combustion chamber section;

a compressor section surrounding the turbine section; and

a starter cartridge located in the combustion chamber section;

wherein the compressor section has two or more spools, capable of rotation independent of one another.

2. An air breathing gas turbine engine comprising:

a casing;

a combustion chamber section located in the casing;

a turbine section surrounding the combustion chamber section so that the combustion chamber section is nested at least in part within the turbine section,;

a compressor section surrounding the turbine section, the compressor section having two or more spools, capable of rotation independent of one another; and



a starter cartridge mounted to the casing so that when ignited, the starter cartridge exhausts gas within the combustion chamber section.

3. The engine according to Claim 2, wherein a rotor portion of the turbine section forms at least part of the combustion chamber section.

4. The engine according to Claim 2, wherein the starter cartridge is a solid fuel gas generator.

5. The engine according to Claim 2, wherein exhaust gas from the starter cartridge pre-warms the combustion chamber section.

6. The engine according to Claim 2, wherein the starter cartridge is threaded into an aperture of the casing.

7. An air breathing gas turbine engine comprising:

a combustion chamber section;

a turbine section surrounding the combustion chamber section so that at least part of the combustion chamber section is nested within the turbine section;

a compressor section surrounding the turbine section so that at least part of the turbine section is nested within the compressor section; and

a starter cartridge connected to the combustion chamber section for feeding gases into the combustion chamber section,



wherein the starter cartridge has a base shaped to define a toroidal region of the combustion chamber section.

8. The engine according to Claim 7, wherein compressor blades of a second compressor stage of the compressor section and turbine blades of a second turbine stage of the turbine section are mounted on a second rotor of the turbine engine, a second rotor portion having at least part of the turbine second stage thereon forming at least part of the combustion chamber section.

9. The engine according to Claim 8, wherein the toroidal region is a recirculation region of the combustion chamber section.

10. A gas turbine engine comprising:

an outer casing;

a first rotor located in the outer casing; and

a second rotor located in the outer casing;

wherein the first rotor has a first compression portion and a first turbine portion, the first compression portion substantially surrounding the turbine portion of the first rotor, and wherein the first rotor has an exo-skeletal arrangement with an outer support ring retaining blades of at least one of the first compression portion or the first turbine portion.

11. The engine according to Claim 10, wherein the first rotor and second rotor define a compressor section of the turbine engine, a turbine section of the turbine engine, and a combustion chamber section of the turbine engine,



and wherein the combustion chamber section is surrounded by the turbine section, and the turbine section is surrounded by the compressor section.

12. The engine according to Claim 11, wherein the second rotor has a second compression portion and a second turbine portion, and wherein the second rotor has another exo-skeletal arrangement with a second outer support ring retaining blades of the second compression portion and the second turbine portion.

13. The engine according to Claim 10, wherein the first rotor has another outer support ring retaining at least part of the blades of the first turbine portion.

14. The engine according to Claim 10, wherein the outer support ring is fiber reinforced.

15. The engine according to Claim 11, wherein the first rotor has a fuel feed surface disposed so that when the first rotor is turned, fuel is centrifuged by the first rotor to be injected into an air flow path of the engine.

16. The engine according to Claim 10, wherein the blades of the first turbine portion have a free inner edge.

17. A turbojet engine comprising:

an air breathing gas turbine engine comprising:

a combustion chamber section;

a turbine section surrounding the combustion chamber section so that the combustion chamber section is nested at least in part within the turbine section, a rotor portion of the turbine section forming at least part of the combustion chamber section; and



a compressor section surrounding the turbine section;

wherein the compressor section has two or more spools, capable of rotation independent of one another.

18. The turbojet engine according to Claim 17, further comprising a starter cartridge for starting the gas turbine engine, and a boost cartridge for providing boost to the turbojet engine.

19. The turbojet engine according to Claim 18, wherein the starter cartridge is disposed on the gas turbine engine so that the starter cartridge exhausts gas within the combustion chamber section.

20. The turbojet engine according to Claim 18, wherein the starter cartridge and boost cartridge are substantially the same.

21. The turbojet engine according to Claim 18, further comprising a starter cartridge ignition system, and a boost cartridge ignition system, the boost cartridge ignition system and the starter cartridge ignition system being connected to a common ignition initiator system of the turbojet engine.

22. An ultra-high bypass engine comprising:

an air breathing gas turbine engine; and

a fan section operably connected to the air breathing gas turbine engine so that exhaust gases from the air breathing gas turbine engine impinge on



at least a portion of the fan section for driving the fan section;

wherein the air breathing gas turbine engine comprises:

a combustion chamber section;

a turbine section surrounding the combustion chamber section so that the combustion chamber section is nested at least in part within the turbine section, a rotor portion of the turbine section forming at least part of the combustion chamber section; and

a compressor section surrounding the turbine section, the compressor section having two or more spools, capable of rotation independent of one another.

23. The ultra-high bypass engine according to Claim 22, wherein the fan section has a rotatable plenum interfacing with an exhaust of the air breathing gas turbine engine.

24. The ultra-high bypass engine according to Claim 22, wherein the fan section has hollow fan blades defining passages through which the exhaust gasses are directed for driving the fan blades.

25. The ultra-high bypass engine according to Claim 24, wherein the passages are connected to aft facing tip jets in the fan blades so that the exhaust gasses are effluxed through the tip jets.

26. The ultra-high bypass engine according to Claim 24, wherein the passages are connected to aft facing slots on



the fan blades so that the exhaust gasses are effluxed through the slots.